

REPORT
OF THE
CANADIAN ARCTIC EXPEDITION
1913-18

VOLUME IV: BOTANY

PART E: MOSSES

By R. S. WILLIAMS



OTTAWA
THOMAS MULVEY
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1921

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Report of the Canadian Arctic Expedition, 1913-18.

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1921

21 10/10/1911 14 1/2 10.7

Mosses of the Canadian Arctic Expedition, 1913-1918.

By R. S. WILLIAMS.

New York Botanical Garden, Bronx Park, New York.

The following list enumerates 68 species of the true mosses. The genus most largely represented is *Drepanocladus* with 11 species, all sterile; next come *Bryum* with 9 species, 5 of which are fruiting; all the other genera, 33 in number, are represented by 1 or 2 species except *Dicranum* of which there are 3, one of which *C. elongatum* is in fruit, and *Stereodon* which contains 4 species.

The greatest number of species (7) separated out from one collection and growing more or less intimately associated, were obtained from a piece of sod, some 4 by 6 inches on the upper surface, cut out from the tundra on Barter island on the coast of arctic Alaska. These seven species, all sterile and mentioned in the order of their abundance, the commonest first, are as follows:—*Catocopium nigratum*, *Swartzia montana*, *Drepanocladus brevifolius*, *Bryum neodamense*, *Chrysohypnum stellatum*, *Encalypta brevicornis*, and *Drepanocladus scorpioides*. From a small collection made on Sadlerochit river about twenty-five miles inland from Camden bay, Alaska, the following were separated out:—*Bryum pallescens*, *Leptobryum pyriforme*, *Mnium affine*, *Drepanocladus aduncus* and *Rhytidium rugosum*; the *Bryum* and *Leptobryum* bearing fruit.

The specimens are sterile unless otherwise stated. One species, *Bryum neodamense*, found in Europe, from the Pyrenees to the arctic coast, does not seem to have been credited before to America. Another, *Drepanocladus brevifolius*, has only been noted from Greenland, while two others are described as new.

The region collected over extends from about latitude 65° to 70° 35' N., and from the northern Alaska coast eastward to about longitude 110° W., and unless otherwise noted the specimens were collected by Mr. F. Johansen.

CLASS MUSCI

Subclass PHAGNALES

Family SPHAGNACEAE

Genus *Sphagnum* (Dill.) Ehrh.

Sphagnum subsecuncum Nees.

Tundra pond at Teller, Port Clarence, Alaska, Aug. 6, 1913.

Sphagnum fuscum, (Sch.) H. Klinggr

High tundra swamp on Herschel island, Yukon Territory, July 31, 1916.

Subclass BRYALES

Tribe ACROCARPI

Family DITRICHACEAE

Genus *Swartzia* Ehrh.; Hedw.

Swartzia montana (Lam.) Lindb.

On cliffs on "Ptarmigan creek," Sadlerochit river, Alaska, Nov. 13, 1913. Tundra on Barter island, Alaska, summer 1918, J. Hadley; fruiting. Tundra at Bernard harbour, Northwest Territories, June, 1916. On dolomite cliffs at Murray point, Victoria island, Northwest Territories, March 25, 1916.

Genus **Ditrichum** Timm.**Ditrichum flexicaule** var. **densum** Braithw.

Near Colville hills, Victoria island, Northwest Territories, July, 1915, D. Jenness. Tundra at Bernard harbour, Northwest Territories, June, 1916.

Ditrichum giganteum R. S. Will.

Port Epworth, Coronation gulf, Northwest Territories, June, 1915, J. R. Cox and J. J. O'Neill.

Family **DICRANACEAE**.Genus **Dicranum** Hedw.**Dicranum Bergeri** Blandow.

On lower hills of Sadlerochit river, 25 miles inland from Camden bay, Alaska, Nov. 13, 1913.

Dicranum elongatum Schleich.

Tundra hummock at Collinson point, Alaska, June 7, 1914.

Dicranum neglectum Juratzka.

Tundra at Collinson point, Alaska, June 7, 1914. Tundra at Collinson point, Alaska, Oct. 9, 1913. Basalt island southeast of Lady Franklin point, Coronation gulf, Northwest Territories, March 12, 1916.

Family **POTTIACEAE**.Genus **Tortella** (C.M.) Limpr.**Tortella tortuosa** (L.) Limpr.

Moist places on basalt island southeast of Lady Franklin point, Coronation gulf, Northwest Territories, March 12, 1916.

Tortella fragilis (Drum.) Limpr.

Port Epworth, Coronation gulf, Northwest Territories, June, 1915, J. R. Cox and J. J. O'Neill.

Genus **Didymodon** Hedw.**Didymodon rubellus** (Hoffm.) Br. & Sch.

Young point, Northwest Territories July 21st, 1916. On dolomite rocks on Sutton island, Dolphin and Union strait, Northwest Territories, April 10, 1916.

Genus **Barbula** Hedw.**Barbula Johansenii**, n.sp.

Dioica; humillima (3-4 mm.); caules simplices, cespitosi, virides; folia siccata erecto-appressa, imbricata, ovato-lanceolata, non papillosa, 1.5 mm. longa, margine integro, plus minus revoluta; cellulis inferioribus oblongis vel

rectangularibus, pellucidis, superioribus subincrassatis, depresso-rotundatis; nervo excurrente (0.4--0.5 mm.), crasso, viridi, fragilissimo, superne saepe latiore.

Barbulae aculae (Brid.) Brid. proxima.

Pl. 1, fig. 1-XII. Sterile, only flowers containing 3-5 archegonia with few or no paraphyses found; the archegonial leaves lanceolate with mostly a long-excurrent costa enlarging toward the apex, the inner leaf often very small and consisting largely of the costa; stems 3-4 mm. high, with rhizoids at the base, about 125 μ in diameter, with rather indistinct central strand and walls of 1 or 2 layers of cells with but slightly thickened cell-walls; stem-leaves erect, rather closely appressed-imbricate when dry, ovate-lanceolate, the blade up to 1.5 mm. long and .40 mm. wide, with an excurrent costa up to 130 μ long above the blade, often enlarging and somewhat flattened toward the apex and mostly broken off in the older leaves, in cross-section showing 2-4 guide cells without stereid cells in the upper part but in lower costa with rather small, thick-walled cells above and below the guide-cells, extending to the surface; leaf-margin entire, more or less recurved along the middle; cells of leaf smooth, in the upper half of blade mostly transversely oval with thickened walls, the median cells 8-10 μ by 5-8 μ gradually changing below the middle of leaf to the more or less oblong or rectangular and paler cells of the basal part.

Type locality, Murray point, Victoria island, latitude 68° 40' N., on dolomite cliffs, March 25, 1916, Frits Johansen.

This species comes nearest to *B. acula* (Brid.) Brid., but the elongate basal cells extend farther up the leaf and the stereids of the lower part of the costa are not so well defined.

***Barbula vinealis* Brid.**

Atkoon creek, Clifton point, Northwest Territories, May 6, 1916, D. Jenness. Valley back of Bernard harbour, Northwest Territories, May 9, 1916, F. Johansen.

Genus ***Pottia* Ehrh.**

***Pottia Heimii* var. *obtusifolia* Hagen**

Tundra at Cape Bathurst, Northwest Territories, latitude 70° 35' N., July 26, 1916, fruiting.

Genus ***Tortula* Hedw.**

***Tortula ruralis* (L.) Ehrh.**

On boulder at Konganevik, Camden bay, Alaska, June 29, 1914. Valley back of Bernard harbour, Northwest Territories, May 9th, 1916. Island near Cockburn point, Dolphin and Union strait, Northwest Territories, July 15, 1916.

Family **ENCALYPTACEAE.**

Genus ***Encalypta* Schreb.**

***Encalypta procera* Bruch.**

On cliffs on "Ptarmigan creek," Sadlerochit river, Alaska, Nov. 13, 1913.

***Encalypta brevicolla*, Bruch.**

Tundra on Barter island, arctic coast of Alaska, summer 1918, J. Hadley.

Family GRIMMIACEAE.

Genus *Racomitrium* Brid.*Racomitrium hypnoides* (L.) Lindb.

Tundra at cape Barrow, Coronation gulf, Northwest Territories, Aug. 6, 1915, J. J. O'Neill. On basalt outcrop at mouth of "Mackenzie river" (of Dr. Rae), Victoria island, Northwest Territories, Canada, March 29, 1916.

Family ORTHOTRICHACEAE.

Genus *Orthotrichum* Hedw.*Orthotrichum Killiasii* C.M.

Harbour island, Bernard harbour, Northwest Territories, June 10, 1916 and tundra at Bernard harbour, Northwest Territories, June, 1916; fruiting. From dolomite rock cliff, at mouth of "Mackenzie river," (of Dr. Rae) south shore of Victoria island, Northwest Territories, March 29, 1916. On boulders at Bernard harbour, Northwest Territories, June, 1916. "Uluksok's island," Bernard harbour, Northwest Territories, June 12, 1916. Bernard harbour, Northwest Territories, June 11, 1915; fruiting. Cape Barrow, Coronation gulf, Northwest Territories, Aug. 1915. R. M. Anderson.

Family SPLACHNACEAE.

Genus *Tetraplodon* B.S. & G.*Tetraplodon bryoides* (Zoeg.) Lindb.

Bernard harbour, Northwest Territories, July 3, 1916. Tundra at Collinson point, Alaska, June 3, 1914. Tundra at Young point, Northwest Territories, July 21, 1916. The specimens all fruiting.

Genus *Haplodon* R. Br.*Haplodon Wormskjoldii* (Hornem.) R. Br.

Creek bed at Bernard harbour, Northwest Territories, July 9, 1915. Bernard harbour, Northwest Territories, July 3, 1916. All in fruit.

Family BRYACEAE.

Genus *Leptobryum* (B.S. & G.) Wils.*Leptobryum pyriforme* (L.) Wils.

On boulders, Sadlerochit river, about 30 miles inland from Camden bay, Alaska, Nov. 13, 1913; fruiting.

Genus *Bryum* Dill.*Bryum pendulum* (Hornsch.) Sch.

Creek bed at Bernard harbour, Northwest Territories, July 9, 1915; fruiting.

Bryum arcticum (R.Br.) B.S. & G. Bry. Eur.

Island near Cockburn point, Dolphin and Union strait, Northwest Territories, July 15, 1916. Probably the same; tundra at Young point, Northwest Territories, July 21, 1916. Both in fruit, but the latter with capsules infected by a fungus.

Bryum Agattuense Philib.

Small island at Bernard harbour, Northwest Territories, June 17, 1916. Having seen no authentic specimens of this species, these sterile, flagelliferous specimens are somewhat doubtfully referred here.

Bryum mucronigerum Philib.

Bernard harbour, Northwest Territories, July 3, 1916. From same locality, creek-bed, July 9, 1916. Both in fruit.

Bryum calophyllum R. Br.

Port Epworth harbour, Coronation gulf, Northwest Territories, June 27, 1915, J. J. O'Neill.

Bryum neodamense Itzig.

Tundra on Barter island, arctic coast of Alaska, J. Hadley, summer, 1918. No previous record found for North America.

Bryum suborbiculare Philib.

On rocks on Sutton island, Dolphin and Union strait, Northwest Territories, April 10, 1916. The specimens are sterile and in rather poor condition, but apparently belong here.

Bryum Wrightii Sulliv.

Tundra at Bernard harbour, Northwest Territories, June 16, 1915; fruiting.

Bryum pallescens Schleich.

Tundra swamp at Konganevik, Camden bay, Alaska, June 30, 1914. Mountain slopes Sadlerochit river about 30 miles inland from Camden bay, Alaska, Nov. 10 and 13, 1913. Atkoon creek, Clifton point, Northwest Territories, May 6, 1916, D. Jenness. Creek-bed at Bernard harbour, Northwest Territories, July 9, 1915. All fruiting except the ones from Atkoon creek.

Family **MNIACEAE**.Genus **Mnium** (Dill.) L.**Mnium affine**, Bland.

From boulder, Sadlerochit river, 30 miles inland from Camden bay, Alaska, Nov. 13, 1913. Shingle point, western edge of Mackenzie river delta, Yukon Territory, Aug. 4, 1914, J. R. Cox and J. J. O'Neill.

Genus **Cinclidium** Sw.; Schrad.**Cinclidium subrotundum** Lindb.

Shore of big lake at Konganevik, Camden bay, Alaska, June 26, 1914.

Family **AULACOMNIACEAE**.Genus **Aulacomnium** Schwaegr.**Aulacomnium palustre** var. **imbricatum** B.S. & G. Bry. Eur.

In swamp on Herschel island, Yukon Territory, July 31, 1916; Diabase island in Coronation gulf, Northwest Territories, March 12, 1916.

Aulacomnium turgidum (Wahl.) Schwaegr.

From lower hill-tops of Sadlerochit river about 25 miles inland from Camden bay, Alaska, Nov. 13, 1913.

Family **CATOSCOPIACEAE**.Genus **Catoscopium** Brid.**Catoscopium nigratum** (Hedw.) Brid.

Barter island, arctic coast of Alaska, summer, 1918, J. Hadley.

Family **BARTRAMIACEAE**.Genus **Philonotis** Brid.**Philonotis fontana** (L.) Brid.

From warm creek tributary to Sadlerochit river, Camden bay, Alaska, Nov. 6, 1913.

Family **TIMMIACEAE**.Genus **Timmia** Hedw.**Timmia bavarica** Hessel.

Tundra at Bernard harbour, Northwest Territories, June, 1916.

Tribe **PLEUROCARPI**.Family **ENTODONTACEAE**.Genus **Holmgrenia** Lindb.**Holmgrenia chrysea** (Schwaegr.) Lindb.

Diabase island in Coronation gulf, Northwest Territories, March 12, 1916.

Family **LESKEACEAE**.Genus **Thuidium** B.S. & G.**Thuidium abietinum** (L.) B.S. & G. Bry. Eur.

Port Epworth, Coronation gulf, Northwest Territories, June, 1915, J. R. Cox and J. J. O'Neill. With *Cassiope tetragona* in creek below Sandstone rapids, Coppermine river, Northwest Territories, Feb. 15, 1915.

Family **HYPNACEAE**.Genus **Amblystegium** B.S. & G.**Amblystegium compactum** (C.M.) Aust.

On dolomite rock, Sutton island, Dolphin and Union strait, April 10, 1916.

Amblystegium serpens (L.) B.S. & G. Bry. Eur.

Small island between Chantry island and mainland, near Bernard harbour, Northwest Territories, June 17, 1916. Harbour island at Bernard harbour, June 10, 1916, F. Johansen.

Genus **Hygroamblystegium** Loeske.**Hygroamblystegium filicinum** (L.) Loeske.

From warm creek tributary to Sadlerochit river, about 25 miles inland from Camden bay, Alaska, Nov. 6, 1913.

Hygroamblystegium noterophilum (Sull.) Warnst.

Locality, etc., of preceding.

Genus **Drepanocladus** (C.M.) Roth.**Drepanocladus aduncus** (L.) Warnst.

On boulder at Konganevik, Camden bay, Alaska, June 29, 1914. Tundra hummock, Collinson point, Alaska, June 3, 1914. On boulder, Sadlerochit river about 30 miles inland from Camden bay, Alaska, Nov. 13, 1913. Shingle point, western edge of Mackenzie river delta, August, 1914. J. R. Cox and J. J. O'Neill. Tundra at Young point, Northwest Territories, July 21, 1916.

Drepanocladus revolvens (Sw.) Warnst.

Pond in swamp at Bernard harbour, Northwest Territories, June 16, 1915.

Drepanocladus Cossoni (Sch.) Roth.

Mountain slopes, Sadlerochit river, about 30 miles inland from Camden bay, Alaska, Nov. 10, 1913.

Drepanocladus fluitans (Dill.) Warnst.

Attached to stones in creek-bed at Bernard harbour, Northwest Territories, Aug. 16, 1915.

Drepanocladus Kneiffii (Sch.) Warnst.

Shore of big lake at Konganevik, Camden bay, Alaska, June 26, 1914.

Drepanocladus Kneiffii var. **laxum** Sch.

Pond on Pihumalerksiak island, Cockburn point, Northwest Territories, July 15, 1916.

Drepanocladus Sentneri (Sch.) Warnst.

Pond on Chantry island, Dolphin and Union strait, Northwest Territories, June 17, 1916.

Drepanocladus Wilsoni (Sch.) Roth.

Brook swamp on tundra at cape Bathurst, Northwest Territories, July 26 1916. A lax form; locality of preceding (tundra), July 26, 1916.

Drepanocladus brevifolius (Lindb.) Warnst.

Barter island, arctic coast of Alaska, summer, 1918, J. Hadley. Previously reported for North America only from Greenland.

Drepanocladus trifarius (Web. & Mohr.) Broth.

From pond on Chantry island, Dolphin and Union strait, Northwest Territories, June 17, 1916.

Pond in swamp at Bernard harbour, Northwest Territories, June 16, 1915.

Drepanocladus scorpioides (L.) Warnst.

Barter island, arctic coast of Alaska, summer, 1918, J. Hadley. Pond at Bernard harbour, Northwest Territories, July 3, 1916. Shore of big lake at Bernard harbour, July 19, 1915. Pond at Bernard harbour, Aug. 16, 1915. Attached to stones in creek-bed, Bernard harbour, Aug. 16, 1915.

Genus **Calliergon** (Sull.) Kindb.**Calliergon giganteum** (Sch.) Kindb.

Tundra at cape Bathurst, Northwest Territories, July 26, 1916. Attached to stones in creek at Bernard harbour, Northwest Territories, Aug. 16, 1915.

Calliergon sarmentosum (Wahlenb.) Kindb.

Probably this but with more distant leaves and the leaf-cells with walls thinner and less pitted than is usual. Shore of big lake at Konganevik, Camden bay, Alaska, June 26, 1914.

Genus **Chrysohypnum** Hampe.**Chrysohypnum stellatum** (Schreb.) Loeske.

From bottom of ice covered pond on tundra at Collinson point, Alaska, October 9, 1913. Cliffs on "Ptarmigan creek," Sadlerochit river, Camden bay, Alaska, Nov. 13, 1913. Barter island, arctic coast of Alaska, summer, 1918, J. Hadley. Pond on Chantry island, Northwest Territories, June 17, 1916. From shore of big lake at Bernard harbour, Northwest Territories, July 19, 1915.

Chrysohypnum arcticum, n.sp.

Flores et fructus ignoti; caulis brevis (1-2 cm.), pallide lutescens, ramis paucis; folia caulina e basi appressa, concava, late ovata vel suborbicularia subito in acumen reflexum producta, margine erecto vel involuto, integerrimo; cellulis elongatis, pellucidis non incrassatis, latis 7-8 μ , basi majusculis, laxis plus minus lutescentibus subincrassatis, alaribus variis ventricose fasciculatis.

Chrysohypnum stellato (Schreb.) Loeske proximum sed folia et cellulae latiorae.

Sterile, no flowers found; the pale, yellowish stems without radicles and with few, irregular branches, in cross-section roundish, about 175 μ in diameter, with small central strand and mostly two outer layers of cells with thickened walls; stem-leaves very concave, not decurrent, up to 1.4 mm. wide and 1.7-2 mm. long, the more or less rotund lower part appressed imbricate, with an acute, widely spreading point, the margins entire all round and flat or incurved; costa mostly short and double or rarely single and usually slightly forking above.

rarely extending 1-3 up the leaf; branch leaves narrower than those of the stem, very concave, entire, mostly ecostate or with very short costa; cells of stem leaves pale, quite uniform to near the base, with thin walls, the median 25-40 μ long and 7-8 μ wide, the basal cells with often somewhat thickened and golden brown walls, broader and shorter than above and extending to the costa, the alar rarely forming a rather distinct, somewhat inflated cluster.

Type locality, swamp on Pihumalerksiak island, a little stony island off Cockburn point, Dolphin and Union strait, Northwest Territories, July 15, 1916. F. Johansen.

This species seems to come nearest *C. stellatum* but the leaves are relatively much broader below, the cells about twice as broad in proportion to their length, with the cell-walls thinner throughout and not pitted.

Genus **Rhytidium** (Sull.) Kindb.

Rhytidium rugosum (Ehrh.) Kindb.

On boulder, Sadlerochit river about 25 miles inland from Camden bay, Alaska, Nov. 13, 1913. Cape Barrow, Coronation gulf, Northwest Territories, middle of August, 1915, R. M. Anderson.

Genus **Hylocomium** B.S. & G.

Hylocomium alaskanum (L. & J.) Kindb.

On boulder at Konganevik, Camden bay, Alaska, June 29, 1914, and on tundra at Collinson point, Alaska, October 9, 1913.

Genus **Stereodon** (Brid.) Mitt.

Stereodon Bambergeri (Sch.) Lindb.

Tundra at Bernard harbour, Northwest Territories, June, 1916.

Stereodon cupressiformis (L.) Brid.

On boulder at Konganevik, Camden bay, Alaska, June 29, 1914. Tundra hummock, Collinson point, Alaska, June 3, 1914.

Stereodon revolutus Mitt.

"Uluksok's island," Bernard harbour, Northwest Territories, June, 1916. Valley back of Bernard harbour, May 9, 1916.

Stereodon Vaucheri (Lesq.) Lindb.

Chantry island, Dolphin and Union strait, Northwest Territories, June 17, 1916.

Family **BRACHYTHECIACEAE.**

Genus **Camptothecium** B.S. & G.

Camptothecium lutescens (Huds.), B.S. & G. Bry. Eur.

Boulder at Konganevik, Camden bay, Alaska, June 29, 1914. Island south-east of Lady Franklin point, Coronation gulf, Northwest Territories, March 12, 1916.

Camptothecium nitens (Schreb.) Sch.

With *Cassiope tetragona* in creek below Sandstone rapids, Coppermine river, Northwest Territories, February 15, 1915.

Genus **Brachythecium** B.S. & G.**Brachythecium albicans** (Neck.) B. S. & G. Bry. Eur.

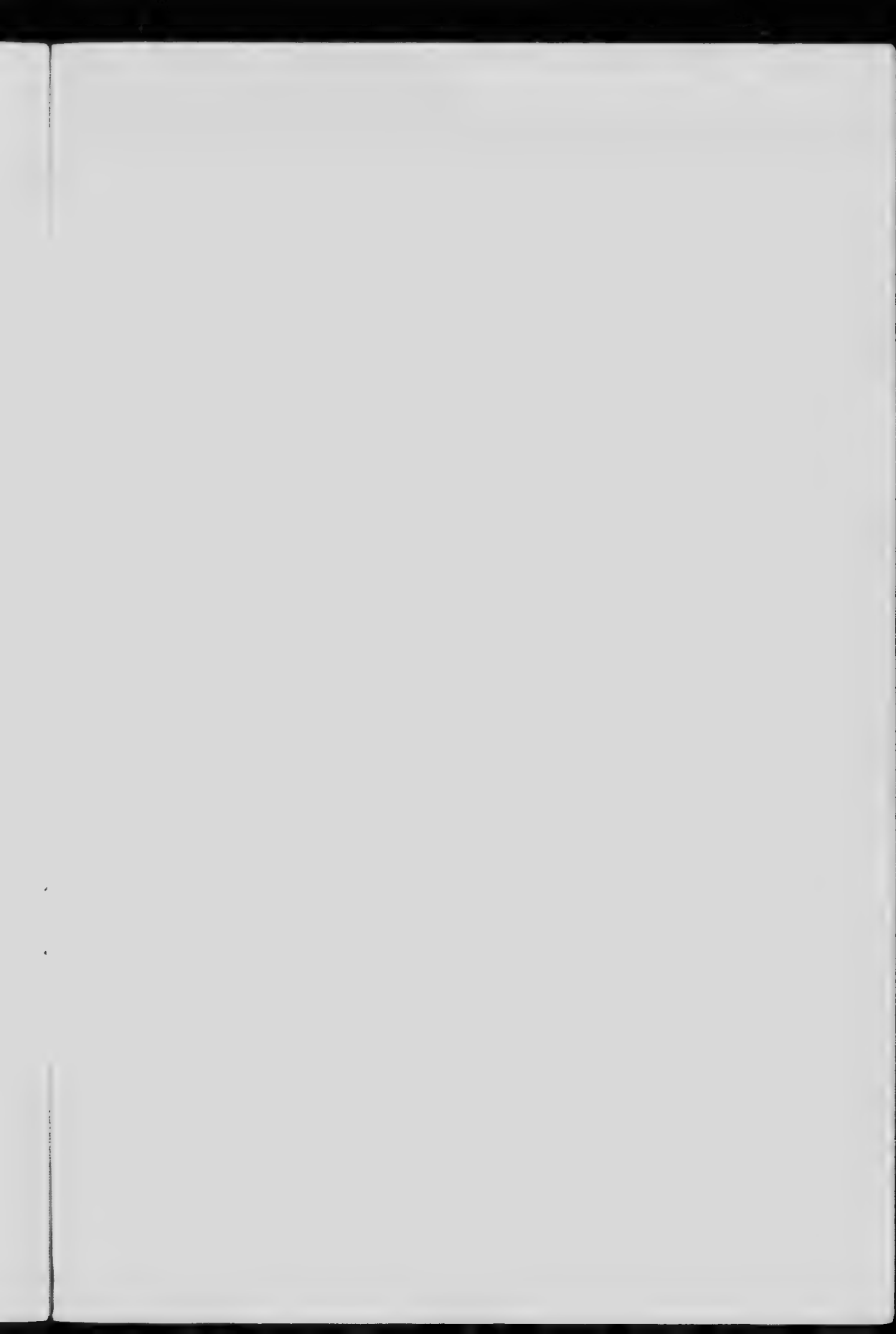
Creek below Sandstone rapids, Coppermine river, Northwest Territories, February, 15, 1915. Cape Barrow, Coronation gulf, Northwest Territories, middle of August, 1915. R. M. Anderson

Brachythecium sp.

Swamp on Pihumalerksiak island, Cockburn point, Northwest Territories, July 15, 1916. Some fragmentary sterile specimens that seem to belong to a *Brachythecium* and near some of the entire-leaved forms of *B. plumorum*.

Genus **Eurhynchium** B.S. & G.**Eurhynchium strigosum** (Hoff.) Br. & Sch.

Tundra at Collinson point, Alaska, Oct. 9, 1913. Cape Barrow, Coronation gulf, Northwest Territories, August, 1915. R. M. Anderson.



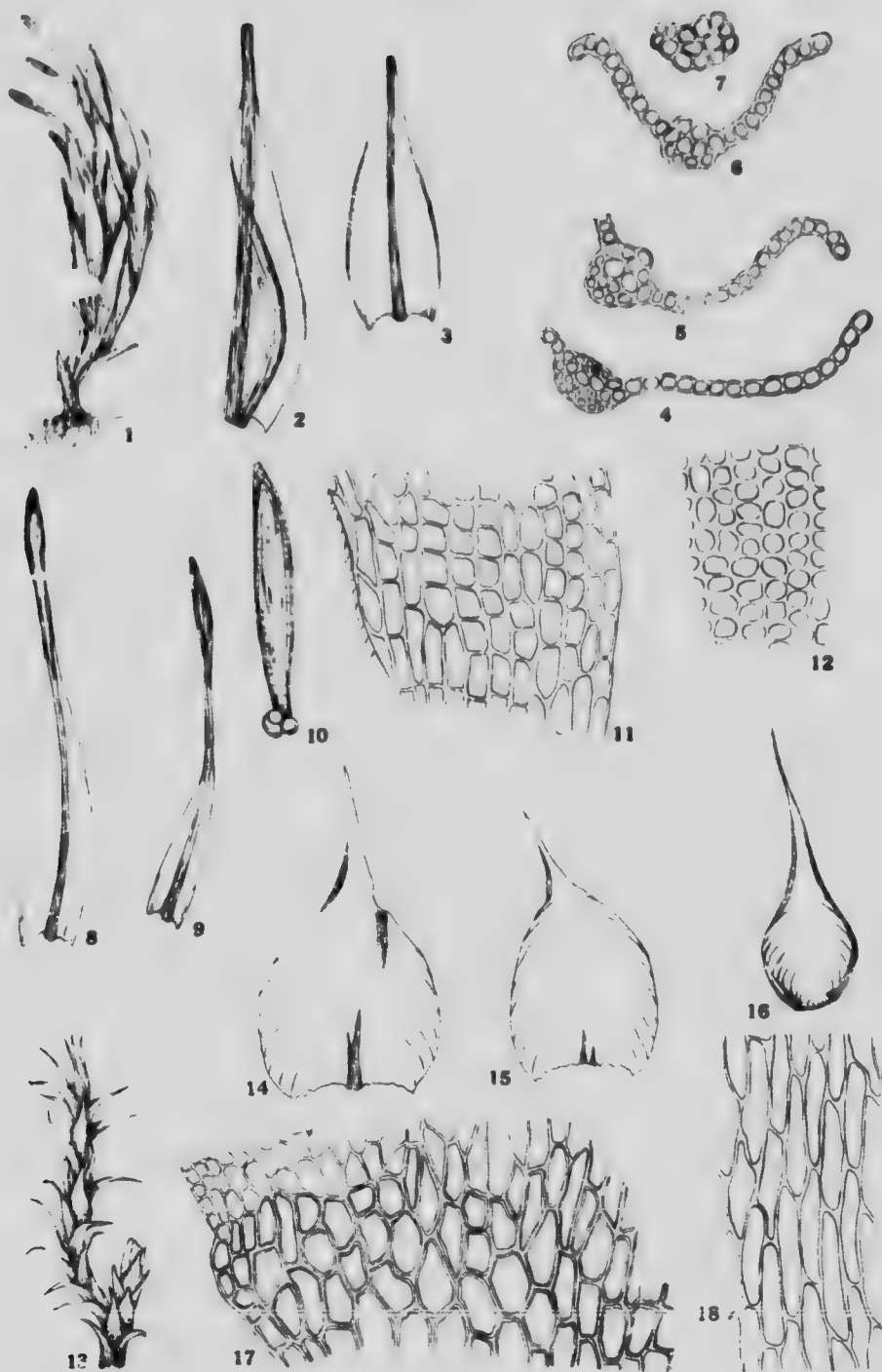
DESCRIPTION OF PLATE.

Barbula Johansenii, n. sp.

- Fig. 1 Plant X 19.
2 Outer perichaetial leaf X 32.
3 Stem-leaf X 32.
4 & 5 Cross sections of lower and middle parts of stem-leaf X 210.
6 & 7 Cross sections of upper part of leaf and excurrent costa X 210.
8 & 9 Inner perichaetial leaves X 32.
10 Apex of costa broken off and starting new growth X 50.
11 Basal cells of stem-leaf X 210.
12 Median cells X 245.

Chrysohypnum arcticum, n. sp.

- Fig. 13 Plant X 6.
14 & 15 Stem leaves X 19.
16 Branch leaf X 19.
17 Basal cells of leaf X 210.
18 Median cells X 245.





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